Huawei G560 V5 (Intel Xeon Gold 6140)

**CPU2017 Integer Rate Result**

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**SPECrate2017_int_base = 193**

**SPECrate2017_int_peak = Not Run**

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### Hardware

- **CPU Name:** Intel Xeon Gold 6140
- **Max MHz.:** 3700
- **Nominal:** 2300
- **Enabled:** 36 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 24.75 MB I+D on chip per chip
- **Other:** None

| Memory: | 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R) |
| Storage: | 1 x 1920 GB SATA SSD |
| Other: | None |

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.6 (x86_64) (Maipo)
- **Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux;
  Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux
- **Parallel:** No
- **Firmware:** Version 1.09 Released Jan-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
## Huawei

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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>72</td>
<td>757</td>
<td>151</td>
<td>751</td>
<td>153</td>
<td>754</td>
<td>152</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>72</td>
<td>641</td>
<td>159</td>
<td>641</td>
<td>159</td>
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<td>505.mcf_r</td>
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<td>254</td>
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<td>252</td>
<td>463</td>
<td>251</td>
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<tr>
<td>520.omnetpp_r</td>
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<td>735</td>
<td>129</td>
<td>737</td>
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<tr>
<td>523.xalanbmkr</td>
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<td>218</td>
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<td>349</td>
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<tr>
<td>525.x264_r</td>
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<td>409</td>
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<td>404</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
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<td>518</td>
<td>159</td>
<td>518</td>
<td>159</td>
<td>517</td>
<td>159</td>
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<tr>
<td>541.leela_r</td>
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<td>798</td>
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<td>768</td>
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<td>552</td>
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<td>549</td>
<td>344</td>
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<tr>
<td>557.xz_r</td>
<td>72</td>
<td>597</td>
<td>130</td>
<td>600</td>
<td>130</td>
<td>601</td>
<td>129</td>
</tr>
</tbody>
</table>

**Results Table**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

### General Notes

Environment variables set by runcpu before the start of the run:

```
```

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM

Memory using Redhat Enterprise Linux 7.5

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

```
sync; echo 3 > /proc/sys/vm/drop_caches
```

runcpu command invoked through numactl i.e.:

```
umactl --interleave=all runcpu <etc>
```

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

(Continued on next page)
Huawei
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**General Notes (Continued)**

is mitigated in the system as tested and documented.

**Platform Notes**

BIOS configuration:
Power Policy Set to Performance
SNC Set to Enabled
IMC Interleaving Set to 1-way Interleave
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Tue Apr 16 01:05:42 2019

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) Gold 6140 CPU @ 2.30GHz
  2 "physical id"s (chips)
  72 "processors"
 cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
  cpu cores : 18
  siblings : 36
  physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                72
On-line CPU(s) list:   0-71
Thread(s) per core:    2
Core(s) per socket:    18
Socket(s):             2
NUMA node(s):          4
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Gold 6140 CPU @ 2.30GHz
Stepping:              4
CPU MHz:               2300.000
BogoMIPS:              4600.00
Virtualization:        VT-x
```

(Continued on next page)
## SPEC CPU2017 Integer Rate Result

**Huawei**

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---

### Platform Notes (Continued)

```plaintext
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 25344K  
NUMA node0 CPU(s): 0-2,5,6,9,10,14,15,36-38,41,42,45,46,50,51  
NUMA node1 CPU(s): 3,4,7,8,11-13,16,17,19,39,40,43,44,47-49,52,53  
NUMA node2 CPU(s): 18-20,23,24,27,28,32,33,54-56,59,60,63,64,68,69  
NUMA node3 CPU(s): 21,22,25,26,29-31,34,35,57,58,61,62,65-67,70,71  
Flags: fpu vme de pse sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 intel_patin intel_pt ssbd mba ibbr ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust mmx sse sse2 smep bmi1 hle avx2 smap bmi2  invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaevect xsaves xgetbv1 cmqm_l1c cmqm_occmap llc cmqm_mbb_local dtherm ida arat pin pts pku ospke spec_ctrl intel_stibp flush_l1d
```

/proc/cpuinfo cache data  
cache size : 25344 KB

From numactl --hardware  
**WARNING:** a numactl 'node' might or might not correspond to a physical chip.  
available: 4 nodes (0-3)  
node 0 cpus: 0 1 2 5 6 9 10 14 15 36 37 38 41 42 45 46 50 51  
node 0 size: 96883 MB  
node 0 free: 93963 MB  
node 1 cpus: 3 4 7 8 11 12 13 16 17 19 39 40 43 44 47 48 52 53  
node 1 size: 98304 MB  
node 1 free: 95689 MB  
node 2 cpus: 18 19 20 23 24 27 28 32 33 45 55 56 59 60 63 64 66 68 69  
node 2 size: 98304 MB  
node 2 free: 95590 MB  
node 3 cpus: 21 22 25 26 29 30 31 34 35 57 58 61 62 65 66 67 70 71  
node 3 size: 98304 MB  
node 3 free: 95338 MB  
node distances:  
node 0 1 2 3  
0: 10 11 21 21  
1: 11 10 21 21  
2: 21 21 10 11  
3: 21 21 11 10  

From /proc/meminfo  
MemTotal: 394621448 KB

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Platform Notes (Continued)

HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
    os-release:
        NAME="Red Hat Enterprise Linux Server"
        VERSION="7.6 (Maipo)"
        ID="rhel"
        ID_LIKE="fedora"
        VARIANT="Server"
        VARIANT_ID="server"
        VERSION_ID="7.6"
        PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
    redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
    system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:
    Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
    x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Apr 15 19:58

SPEC is set to: /spec2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   300G  8.2G  292G   3% /

Additional information from dmidecode follows. WARNING: Use caution when you interpret
this section. The 'dmidecode' program reads system data which is "intended to allow
hardware to be accurately determined", but the intent may not be met, as there are
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
    BIOS INSYDE Corp. 1.09 01/31/2019
    Memory:
        12x NO DIMM NO DIMM
        12x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)
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**Base Portability Flags (Continued)**

- 523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
- 525.x264_r: -DSPEC_LP64
- 531.deepsjeng_r: -DSPEC_LP64
- 541.leela_r: -DSPEC_LP64
- 548.exchange2_r: -DSPEC_LP64
- 557.xz_r: -DSPEC_LP64

**Base Optimization Flags**

- C benchmarks:
  - -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
  - -qopt-mem-layout-trans=4
  - -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
  - -lqkmalloc

- C++ benchmarks:
  - -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
  - -qopt-mem-layout-trans=4
  - -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
  - -lqkmalloc

- Fortran benchmarks:
  - -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
  - -qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
  - -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
  - -lqkmalloc

The flags files that were used to format this result can be browsed at


You can also download the XML flags sources by saving the following links:

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Tested with SPEC CPU2017 v1.0.5 on 2019-04-16 01:05:41-0400.  